

REMARKS/ARGUMENTS

Applicants would like to thank Examiner Hertzog for the indication of allowable subject matter in the claims of the present application. It is believed that based upon the present amendments, the application will be in condition for allowance.

Claims 1-40 are active in the application. Claim 20 has been amended to address the 35 U.S.C. 112 rejection and correct a redundancy by deleting the phrase “in an amount”. This rejection is supported by the claim and specification as original filed. The specification has been amended to replace the terms “spheroidal” and “microspheroidal” with the terms “spherical” and “microspherical”, respectively. These terms were used interchangeably throughout the application to indicate the shape of the present particles. Accordingly, to clarify and remove any confusion, the specification has been amended to conform with the originally filed claims. The Abstract has also been amended to meet the suggested format. Figure 1 has been added. This figure is described in detail in the specification beginning at page 16, line 8, and is also supported by the disclosures in the two Campbell et al references incorporated by reference in the specification. No new matter has been added by these amendments.

The objection to the Abstract has been obviated by the present amendment and should be withdrawn.

The claims stand rejected under 35 U.S.C. 112, first and second paragraphs, and the specification is objected to, due to the use of the term “spheroidal” in the specification and the term “spherical” in the claims. This rejection/objection has been obviated by the above amendments. In particular, as explained in detail below, it is apparent from a complete reading of the specification and claims, as originally filed, that the terms “substantially spheroidal” and “substantially spherical” are used synonymously. The amendments to the specification are made to enhance clarity of Applicants’ specification and claims by addressing an inconsistency of form, not an inconsistency of substance. No admission, and

no change in the scope of the disclosure, or in the scope of the claims, is intended or made as a result of the amendments to the specification.

The Official Office Action states that “spheroidal” and “spherical” are not synonymous on the basis of definitions taken from Dictionary.com. Although it is true that “spherical” and “spheroidal” have different definitions in a strict geometric sense, the terms have essentially the same meaning in normal, generalized usage. Thus Webster’s New Collegiate Dictionary (1991) defines a spheroid as “...a figure resembling a sphere” and spherical as “... having the form of a sphere or of one of its segments ...” (see attached excerpt from Webster’s).

Although the Official Office Action states that the specification consistently uses the term “spheroidal” in describing the sorbent particles, Applicants note that both terms are used to describe the particles in the specification as originally filed (the term “substantially spherical particles” is found at page 8, line 6, of the original specification). Moreover, in Applicant’s specification and claims as originally filed, the terms “spherical” and “spheroidal” are used in the modified forms of “substantially spherical” and “substantially spheroidal”, clearly indicating that the terms are used in the general, non-specific sense. Accordingly, it is readily apparent that the terms “substantially spherical” and “substantially spheroidal” are used interchangeably in the present application as originally filed. Accordingly, the present rejection and objection to the specification should be withdrawn.

For clarity of the record, it is noted that nothing in the application as originally filed states or implies that a spherical shape is critical to the invention. It is correct that the specification states that prior art sorbents suffer from “one or more” deficiencies including “... (iii) the sorbent is not available in a physical form of a size, shape, and density, suitable for fluidization,” and that the sorbents of the invention “can readily be produced with the necessary reactivity, stability, and mechanical strength properties, and in a suitable physical form and size, allowing their use ... in fluidized-bed ... reactors” . Nevertheless, such disclosure is directed at the skilled artisan who understands that it is the combination of all the physical properties of size, shape, and density , (as specifically set forth above) that determines whether or not a particular sorbent is fluidizable. In particular, fluidizable

particles can be prepared with varying latitudes of shape parameter possibilities, depending on the specifics of the size and density parameters of the specific particles.

The Examiner has objected to Claims 20-27 due to minor informalities. This objection has been obviated by the present amendments to claim 20 and should therefore be withdrawn.

The rejection of claims 20-27 under 35 U.S.C. 112, first paragraph, for lack of enablement is respectfully traversed. In particular, the relatively small crystallite size of the phases of the active zinc component is an inherent product property that is not relevant to the enablement analysis upon which the rejection is based.

Claims 20-27 are process claims directed to the process for preparing fluidizable, attrition resistant, active zinc oxide containing sorbents. Accordingly, the issue of enablement must be directed to the claimed process. The basis for the lack of enablement finding in the *In re Mayhew* holding cited in the Official Office Action is thus not applicable to the present case. The *Mayhew* case holding was based on the inconsistency between a specification teaching that the criticality of a cooling zone at a particular location in a processing cycle as a critical element of the claimed process, and claims which did not include that critical element of the process. In contrast, the present specification fully enables the claimed process for preparing active zinc oxide containing sorbents based on the elements set forth in claim 20 including the specific starting materials and the quantities thereof, and the specific process steps recited therein. The crystallite size properties of sorbents resulting from the process are not taught by the present specification to be a critical element of the process of preparing the sorbents.

In sum, it is respectfully submitted that the issue of enablement must be directed to the claimed process, and that the claimed process is fully enabled by Applicants' specification. Accordingly, it is requested that the rejection of claims 20-27 for failure to meet the enablement requirement of 35 USC § 112, first paragraph, be withdrawn.

Application No. 10/670,206
Reply to Office Action of September 8, 2004

Applicants submit that the application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



J. Derek Mason
Attorney of Record
Registration No. 35,270

Customer Number

22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)

J. Derek Mason
Registration No. 35,270

DOCUMENT2

IN THE DRAWINGS

Please add the attached sheet of drawings which provides Fig. 1. This drawing is fully supported by the description in the specification beginning at page 16, line 8, and the two Campbell et al publications discussed and incorporated by reference therein.

Attachment: FIG. 1

BEST AVAILABLE COPY



WEBSTER'S
Ninth New
Collegiate
Dictionary

BEST AVAILABLE COPY



A GENUINE MERRIAM-WEBSTER

The name *Webster* alone is no guarantee of excellence. It is used by a number of publishers and may serve mainly to mislead an unwary buyer.

A *Merriam-Webster*® is the registered trademark you should look for when you consider the purchase of dictionaries or other fine reference books. It carries the reputation of a company that has been publishing since 1831 and is your assurance of quality and authority.

Copyright © 1991 by Merriam-Webster Inc.

Philippines Copyright 1991 by Merriam-Webster Inc.

Library of Congress Cataloging in Publication Data
Main entry under title:

Webster's ninth new collegiate dictionary.

p. cm.

ISBN 0-87779-508-8. — ISBN 0-87779-509-6 (indexed). — ISBN
0-87779-510-X (deluxe)

1. English language—Dictionaries. I. Merriam-Webster, Inc.
PE1628.W5638 1991

423—dc20

90-47350
CIP

Webster's Ninth New Collegiate Dictionary principal copyright 1983

COLLEGIATE trademark Reg. U.S. Pat. Off.

All rights reserved. No part of this book covered by the copyrights hereon may be reproduced or copied in any form or by any means—graphic, electronic, or mechanical, including photocopying, taping, or information storage and retrieval systems—without written permission of the publisher.

Made in the United States of America

454647R McN92

1134 spelt • spherical

spelt \ˈspelt\ *n* [ME, fr. OE, fr. LL *spelta*, of Gmc origin; akin to MHG *spelte* split piece of wood, OHG *spoltan* to split — more at **SPLIT**] (bef. 12c): a wheat (*Triticum spelta*) with lax spikes and spikelets containing two light red kernels

spelt \ˈspelt\ chiefly Brit past and past part of **SPELL**

speltier \ˈspelt-er\ *n* [prob. alter. of MD *speutier*] (1661): ZINC esp: zinc cast in slabs for commercial use

spe-lunk-er \ˈspi-lŭŋ-kər, ˈspe-\ *n* [L *spelunca* cave, fr. Gk *spelŭnx*: akin to Gk *spelaiōn* cave] (1944): one who makes a hobby of exploring and studying caves

spe-lunk-ing \ˈkiŋ\ *n* (1944): the hobby or practice of exploring caves

spence \ˈspen(t)s\ *n* [ME, fr. MF *despense*, fr. ML *dispensa*, fr. L, fem. of *dispensus*, pp. of *dispensare* to weigh out — more at **DISPENSE**] dial Brit (14c): PANTRY

spen-er \ˈspen(t)-sər\ *n* [George John, 2d earl Spencer †1834 Eng. politician] (1796): a short waist-length jacket

spencer *n* [prob. fr. the name Spencer] (1840): a trysail abaft the foremast or mainmast

Spencerian \ˈspen-sir-ē-ən\ *adj* [Platt R. Spencer †1864 Am. calligrapher] (1878): of or relating to a form of slanting handwriting

Spencerianism \ˈspen-sir-ē-ən-iz-əm\ *n* (1880): the synthetic philosophy of Herbert Spencer that has as its central idea the mechanistic evolution of the cosmos from relative simplicity to relative complexity

spend \ˈspend\ *vb* **spelt** *spend-ing* [ME *spenden*, fr. OE & OF: OE *spendan*, fr. L *expendere* to expend; OF *despendre*, fr. L *dispendere* to weigh out — more at **DISPENSE**] *vi* (12c) 1: to use up or pay out: EXPEND 2 *a*: EXHAUST, WEAR OUT (the hurricane gradually spent itself) *b*: to consume wastefully: SQUANDER (the waters are not ours to ~ — J. R. Ellis) 3: to cause or permit to elapse: PASS (spent the summer at the beach) 4: GIVE UP, SACRIFICE ~ *vi* 1: to expend or waste wealth or strength 2: to become expended or consumed — **spend-er** *n*

spend-able \ˈspen-də-bəl\ *adj* (1500): available for spending

spending money *n* (1598): POCKET MONEY

spend-thrift \ˈspen(d)-θrɪft\ *n* (1601): one who spends improvidently or wastefully — **spendthrift** *adj*

Spenglerian \ˈs(h)pen-ˈ(g)lir-ē-ən\ *adj* (1926): of or relating to the theory of world history developed by Oswald Spengler which holds that all major cultures undergo similar cyclical developments from birth to maturity to decay — **Spenglerian** *n*

Spenserian stanza \ˈspen-sir-ē-ən-ə\ *n* [Edmund Spenser] (1818): a stanza consisting of eight verses of iambic pentameter and an alexandrine with a rhyme scheme ababbcbcc

spent \ˈspent\ *adj* [ME, fr. pp. of *spenden* to spend] (15c) 1 *a*: used up: CONSUMED *b*: exhausted of active or required components or qualities often for a particular purpose (~ grain that remains from wort production is a useful livestock feed) 2: drained of energy or effectiveness: EXHAUSTED 3: exhausted of spawn or sperm (~ salmon)

sperm \ˈspɜrm\ *n*, *pl* sperm or sperms [ME, fr. MF *esperme*, fr. LL *sperma*, *sperma*, fr. Gk, lit., seed; akin to Gk *speirein* to sow — more at **SPROUT**] (14c) 1 *a*: the male fecundating fluid: SEMEN *b*: a male gamete 2: a product (as spermaceti or oil) of the sperm whale

sperm- or spermo- or sperma- or spermi- *comb form* [Gk *sperm-*, *spermo-*, *fr. sperma*]: seed: germ: sperm (*spermatheca*) (*spermary*) (*spermidal*)

spermace-ti \ˈspɜr-mə-ˈset-ē, -ˈset-\ *n* [ME *sperma cete*, fr. ML *sperma ceti* whale sperm] (15c): a waxy solid obtained from the oil of cetaceans and esp. sperm whales and used in ointments, cosmetics, and candles

spermato-go-ni-um \ˈspɜr-mə-ˈgō-nē-əm\ *n*, *pl* -nia \-nē-ə\ [NL, fr. *sperma* + *gon-* + *-ium*] (1897): a flask-shaped or more or less receptacle in which spermatia are produced in some fungi and lichens

sperm-ma-ry \ˈspɜrm-(ə-)rē\ *n*, *pl* -ries [NL *spermarium*, fr. Gk *sperma*] (ca. 1864): an organ in which male gametes are developed

spermat- or **spermato-** *comb form* [MF, fr. LL, fr. Gk, fr. *sperma*, *sperma*]: seed: spermatozoon (*spermand*) (*spermatocyte*)

sperma-the-ca \ˈspɜr-mə-ˈthē-kə\ *n* [NL] (1826): a sac for sperm storage in the female reproductive tract of many lower animals

spermatic \ˈspɜr-mat-ik\ *adj* (1539) 1: relating to sperm or a spermary 2: resembling, carrying, or full of sperm

spermatic cord *n* (1797): a cord that suspends the testis within the scrotum and contains the vas deferens and vessels and nerves of the testis

sperma-tid \ˈspɜr-mət-əd\ *n* (1889): one of the cells that are formed by the secondary spermatocytes and that differentiate into spermatozoa

sperma-ti-um \ˈspɜr-mə-ˈsh(ē)-əm\ *n*, *pl* -tia \-sh(ē)-ə\ [NL, fr. Gk *spermatium*, dim. of *sperma*, *sperma*] (1856): a nonmotile cell functioning or held to function as a male gamete in some lower plants — **sperma-tial** \-sh(ē)-əl\ *adj*

sperma-to-cyte \ˈspɜr-mat-ə-sīt\ *n* (1886): a cell giving rise to sperm cells; esp: a cell of the last generation or next to the last generation preceding the spermatozoon

sperma-to-gen-e-sis \ˈspɜr-mat-ə-ˈjən-ə-səs\ *n* [NL] (1881): the process of male gamete formation including meiosis and transformation of the four resulting spermatids into spermatozoa — **sperma-to-genic** \-jən-ik\ *adj*

sperma-to-go-ni-um \ˈgō-nē-əm\ *n*, *pl* -nia \-nē-ə\ [NL, fr. *sperma* + *gon-* + *-ium*] (1861): a primitive male germ cell — **sperma-to-go-ni-al** \-nē-əl\ *adj*

sperma-to-phore \ˈspɜr-mat-ə-ˈfōr-, ˈfōr-\ *n* [ISV] (1847): a capsule, packet, or mass enclosing spermatozoa extruded by the male and conveyed to the female in the insemination of various lower animals

sperma-phyte \ˈspɜr-mat-ə-ˈfīt\ *n* [deriv. of NL *sperma* + Gk *phyton* plant — more at **PHYTE**] (1897): any of a group (Spermatophyta) of higher plants comprising those that produce seeds and including the gymnosperms and angiosperms — **sperma-phytic** \-mat-ə-ˈfīt-ik\ *adj*

sperma-to-zo-an \ˈspɜr-mat-ə-ˈzō-ən, ˈspɜr-mat-\ *n* (ca. 1900): SPERMATOZOON

sperma-to-zo-id \ˈzō-əd\ *n* [ISV, fr. NL *spermatozoid*] (1857): a male gamete of a plant motile by anterior cilia and usu. produced in an antheridium

sperma-to-zo-on \ˈzō-ən, ˈzō-ən\ *n*, *pl* -zoa \-zō-ə\ [NL] (1836) 1: a motile male gamete of an animal usu. with rounded or elongate head and a long posterior flagellum 2: SPERMATOZOID — **sperma-to-zoal** \-zō-əl\ *adj*

sperm cell *n* (1851): a male gamete: a male germ cell

sper-mi-cid-al \ˈspɜr-mə-ˈsɪd-əl\ *adj* (1935): killing sperm (~ jelly) — **sper-mi-cide** \ˈspɜr-mə-ˈsɪd\ *n*

sper-mio-gen-e-sis \ˈspɜr-mē-ə-ˈjən-ə-səs\ *n* [NL, fr. *spermium* spermatozoon + *-o-* + L *genesis*] (1916) 1: SPERMATOGENESIS 2: transformation of a spermatid into a spermatozoon

sperm nucleus *n* (1887): either of two nuclei that derive from the generative nucleus of a pollen grain and function in the fertilization of a seed plant

sperm oil *n* (1839): a pale yellow oil from the sperm whale

sper-mo-phil \ˈspɜr-mə-ˈfɪl\ *n* [deriv. of Gk *sperma* seed + *philos* loving] (1824): GROUND SQUIRREL

sperm whale \ˈspɜrm-\ *n* [short for *spermaceti* + *whale*] (1839): a large toothed whale (*Physeter catodon*) with a large closed cavity in the head containing a fluid mixture of spermaceti and oil



sperm whale

sper-my \ˈspɜr-mē\ *n* *comb form* [Gk *sperma* seed, sperm]: state of exhibiting or resulting from (such) a fertilization (egamosperry)

sper-ry-lite \ˈspɜr-i-līt\ *n* [Francis L. Sperry, 19th cent. Canad. chemist] (E-lite) (ca. 1909): a mineral P.T.A.S., consisting of a platinum amide occurring near Sudbury, Ontario, in grains and minute isometric crystals of a bluish white color

sper-sar-tite \ˈspɜs-ər-tīt\ *also* **sper-sar-tine** \-tēn\ *n* [F, fr. *Sperma* mountain range, Germany] (ca. 1887): a manganese aluminum garnet usu. containing other elements (as iron and magnesium) in minor amounts

spew \ˈspyu\ *vb* [ME *spewen*, fr. OE *spīwan*; akin to OHG *spīwan* to spit, L *spuere*, Gk *ptyein*] *vi* (bef. 12c) 1: VOMIT 2: to come forth in flood or gush (pornography ~ing from the presses) 3: to ooze out as if under pressure: EXUDE ~ *vi* 1: VOMIT 2: to send or cast forth with vigor or violence or in great quantity — **spew-er** *n*

spew *n* (1609) 1: matter that is vomited: VOMIT 2: material that exudes or is extruded

sphag-nous \ˈsag-nəs\ *adj* (ca. 1828): of, relating to, or abounding in sphagnum

sphag-num \ˈsag-nəm\ *n* [NL, fr. L *sphagnus*, a moss, fr. Gk] (1753) 1: any of a large genus (*Sphagnum*, coextensive with the order *Sphagnales*) of atypical mosses that grow only in wet acid areas where they remain become compacted with other plant debris to form peat 2: a mass of sphagnum plants

sphal-er-ite \ˈsfa-l-ə-ˈrīt\ *n* [G *sphalerit*, fr. Gk *sphaleros* deceitful, *it* *sphallein* to cause to fall; fr. its often being mistaken for galena — more at **SPLIT**] (ca. 1868): a widely distributed ore of zinc composed essentially of zinc sulfide ZnS

S phase *n* (1945): the period in the cell cycle during which DNA replication takes place — compare G₁ PHASE, G₂ PHASE, M PHASE

sphene \ˈsfēn\ *n* [F *sphène*, fr. Gk *sphēn* wedge — more at **SPOON**] (ca. 1815): a mineral CaTiSiO₆ that is a silicate of calcium and titanium and often contains other elements

sphen-odon \ˈsfē-nō-dən, ˈsfen-ə-\ *n* [NL, deriv. of Gk *sphēn* wedge + *odon* tooth — more at **TOOTH**] (1878): TATARA — **sphen-odont** \-dant\ *adj*

sphenoid \ˈsfē-nōid\ or **sphenoid-al** \ˈsfī-nōid-əl\ *adj* [NL *sphenoides*, fr. Gk *sphēnoidēs* wedge-shaped, fr. *sphēn* wedge] (1732) 1: of, relating to, or being a winged compound bone of the base of the cranium 2: *usu* **sphenoidal**: wedge-shaped

sphenoid *n* (1828): a sphenoid bone

sphenop-sid \ˈsfī-nāp-səd\ *n* [deriv. of Gk *sphēn* wedge + NL *opsis*] (1957): any of a subdivision (Sphenopsida) of the tracheophytes characterized by jointed stems, small leaves usu. in whorls at distinct nodes, and sporangia in sporangiophores and made up of the equantums and extinct related forms

spher- or **sphero-** *also* **sphaer-** or **sphaero-** *comb form* [L *sphaer-*, fr. Gk *sphaira*, *sphaira*, fr. *sphaira* sphere]: sphere (*spherule*) (*spherometer*)

spher-al \ˈsfīr-əl\ *adj* (1571) 1: SPHERICAL 2: of or relating to the spheres of ancient astronomy

sphere \ˈsfīr-ə\ *n* [ME *sphere* globe, celestial sphere, fr. MF *sphere*, fr. L *sphaera*, fr. Gk *sphaira*, lit., ball] (14c) 1 *a* (1): the apparent surface of the heavens of which half forms the dome of the visible sky (2): one of the concentric and eccentric revolving spherical transparent shells in which according to ancient astronomy stars, sun, planets, and moon are set *b*: a globe depicting such a sphere: broadly: GLOBE 2 *a*: a globular body: BALL *b*: PLANET, STAR *c* (1): a solid that is bounded by a surface consisting of all points at a given distance from a point constituting its center — see **VOLUME** table (2): the bounding surface of a sphere 3: natural, normal, or proper place; esp: social order or rank 4 *a* *obs*: ORBIT *b*: a field or range of influence or significance — **spher-ic** \ˈsfīr-ik-, ˈsfēr-\ *adj* — **spher-ic-ity** \ˈsfīr-ik-ə-ti\ *n*

sphere *vi* **sphered**; **spher-ing** (1607) 1: to place in a sphere or among the spheres: ENSPHERE 2: to form into a sphere

sphere of influence (1885): a territorial area within which the political influence or the interests of one nation are held to be more or less paramount

spher-ical \ˈsfīr-ikəl, ˈsfēr-\ *adj* (1523) 1: having the form of a sphere or of one of its segments 2: relating to or dealing with a sphere or its properties — **spher-ic-ally** \-k(ə)-lē\ *adv*

